

We claim:

1. A process for autothermal catalytic steam reforming of hydrocarbons comprising passing a reactant mixture of hydrocarbons, oxygen and water or water vapour, heated to a preheating temperature, over a catalyst adiabatically and the catalyst has a coating of a catalyst material on a carrier structure, the catalyst material containing at least one platinum group metal on an oxidic support material selected from the group consisting of aluminum oxide, silicon dioxide, titanium dioxide or mixed oxides thereof and zeolites.
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2. The process according to Claim 1, wherein said catalyst material further contains at least one oxide selected from the group consisting of boron oxide, bismuth oxide, gallium oxide, oxides of the alkali metals, oxides of the alkaline earth metals, oxides of the B group elements and oxides of the rare earth metals in a concentration of up to 40 wt.%, with respect to the total weight of catalyst material.
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- 15 3. The process according to Claim 1, wherein the catalyst material contains rhodium in a concentration of 0.1 to 2 wt.%, with respect to its total weight.
4. The process according to Claim 3, wherein the catalyst material also contains platinum with a ratio by weight of rhodium to platinum of between 20:1 and 2:1.
5. The process according to Claim 3, wherein said active aluminum oxide is the support material for rhodium and optionally platinum.
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6. The process according to Claim 4, wherein said active aluminum oxide is the support material for rhodium and optionally platinum.
7. The process according to Claim 5, wherein the catalyst material also contains cerium oxide.
- 25 8. The process according to Claim 6, wherein the catalyst material also contains cerium oxide.
9. The process according to Claim 7, wherein a monolithic honeycomb structure made from ceramic or metal, open-cell ceramic or metal foam structures, metal sheeting or irregularly shaped components is the carrier structures for the catalytic coating.
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10. The process according to Claim 6, wherein a monolithic honeycomb structure made from ceramic or metal, open-cell ceramic or metal foam structures, metal sheeting or irregularly shaped components is the carrier structures for the catalytic coating.
- 5      11. The process according to Claim 9, wherein the reactent mixture contains aliphatic or aromatic hydrocarbons or hydrocarbon mixtures.
12. The process according to Claim 8, wherein the reactent mixture contains aliphatic or aromatic hydrocarbons or hydrocarbon mixtures.
- 10     13. The process according to Claim 11, wherein the air index  $\lambda$  of the reactant mixture and its preheating temperature are chosen so that a temperature between 600 and 900°C is set at the outlet from the catalyst.
14. The process according to Claim 12, wherein the air index  $\lambda$  of the reactant mixture and its preheating temperature are chosen so that a temperature between 600 and 900°C is set at the outlet from the catalyst.
- 15     15. The process according to Claim 13, wherein a S/C ratio between 0.7 and 4 is set in the reactant mixture.
16. The process according to Claim 14, wherein a S/C ratio between 0.7 and 4 is set in the reactant mixture.